IS

IN ENGLAND

CE

A SUMMARY OF REPORTS ISSUED BY THE BRITISH MINISTRY OF MUNITIONS

By HENRIETTE R. WALTER

PUBLISHED BY
DIVISION OF INDUSTRIAL STUDIES
RUSSELL SAGE FOUNDATION
130 EAST 22D STREET
NEW YORK CITY

April, 1917

Price 20 Cents

MUNITION WORKERS IN ENGLAND AND FRANCE

A SUMMARY OF REPORTS ISSUED BY THE BRITISH MINISTRY OF MUNITIONS

By HENRIETTE R. WALTER

PUBLISHED BY
DIVISION OF INDUSTRIAL STUDIES
RUSSELL SAGE FOUNDATION
130 EAST 22D STREET
NEW YORK CITY

April, 1917

Price 20 Cents

Table of Contents

Munition Workers in England

Out of the exigencies of the great war there have developed in England exceptional industrial difficulties. After nearly a year of wasteful production that exhausted men and machinery, government officials realized that for the workers, instead of "sprinting as if for a short race, the course would be a long one"; and that for the nation its labor power should be as zealously safeguarded as its military strength. The recklessness of helter-skelter haste was dramatically brought home to all England by the famous shell shortage in the spring of 1915, for which Kitchener was blamed. It was a case of the situation's running away with those who should have controlled it. The sudden call for large amounts of clothing, munitions, food, and other necessities of war time, had taken the manufacturers completely by surprise, and the rush to fill orders demoralized industrial conditions. Overtime became the rule, night work and Sunday work were common. Trade unions saw the gains of years swept away. Nearly a year was gone before the government assumed responsibility for organizing the huge business of making war supplies, and almost another year to complete an organization which was efficient.

The crux of the situation was of course in the munitions industry. August, 1914 found the nation without enough guns, shells and other war equipment to carry on its great military operations and with no way to get them quickly or in large volume. In response to the unprecedented demand

for these materials had come an immediate expansion of the industry, which soon exhausted the supply of skilled men and forced employers to recruit their workers from the ranks of the unskilled, both men and women. Stimulated by the exhortations of the press and of cabinet officers and by the public sentiment generally, the expansion proceeded, but without effective organization or control until the spring of 1915.

In the meantime the problem in England had changed during the last six months of 1914 from a serious unemployment situation in July and August to a definite shortage of labor in December. Early in 1915 a campaign was planned to recruit workers, and conferences were urged to settle the grievances of those already at work. In February a committee was appointed to deal with the disputes constantly arising. In March the Board of Trade planned a mobilization of women to do the work of men who had been called to the front, which brought immediate response. In that same month Lloyd George, then Chancellor of the Exchequer, effected a truce with the trade unions which should last through the war, and secured the passage of a bill which gave the government the right to commandeer any factory and turn it over to the production of war munitions. Finally, in April, after eight and a half months of war, it was announced that Lloyd George would head a board "to organize the national output of munitions of war," and about a month later, at the time of the formation of the Coalition Cabinet in May, 1915, a Ministry of Munitions was created, with Lloyd George as its chief.

This step gained, a program of action was decided upon. A munitions bureau was organized; all factories making war material were placed under the control of the government; skilled work-

men at the front were recalled to work in munition plants; men in the colonies and in the United States, experienced in the making of munitions, were offered free transportation to England; a suspension of union rules was urged, and finally, in June, 1915, the passage of the Munitions of War Act effected. This bill prohibited strikes and lockouts in war industries, substituted compulsory arbitration, and suspended all trade union rules "calculated to hamper production." On the other hand, as a concession to labor in recognition of the sacrifices they were making, the profits of employers were limited, and amounts in excess reverted to the national treasury. Provision was also made under the act for the recruiting by the trade unions of a "voluntary army of workmen" from among their members who would sign agreements to go to work wherever their labor was needed. The existing local munitions committees were transformed into labor courts, with power to fine individual workmen for "slacking," for infraction of agreements signed by them as members of the "voluntary army of workmen," and for any offenses tending to "hamper production," and with the further power to make decisions in regard to changes in existing wage rates.

By this time workers on munitions saw themselves stripped of all rights and safeguards that had been theirs in time of peace. Confusion reigned in the industry. In the first burst of patriotic fervor, everything had been sacrificed to speed. Labor laws had broken down; excessive hours of work prevailed. Thousands of women, many of them totally unaccustomed to factory work, had taken up the tasks of the men who were fighting. Employers, taking advantage of the fine spirit in which the women offered their labor to the nation, were in many cases paying very low

wages. Labor unions were dissatisfied with the setting aside of their rules, and especially with the so-called "dilution" of labor. The country fairly seethed with threatened and active labor disturbances.

The Munitions Act seemed to aggravate rather than to appease this dissatisfaction. The munitions courts, especially, appeared to antagonize the trade unionist, because of biased administration of the provisions of the Act. On account of the power of employers to refuse discharge certificates to their employes, workers could be kept wageless and idle for weeks at a time, or be forced to accept wages far below the standard rates, or be compelled to work excessive overtime, at night or on Sunday, and without extra remuneration. These and other arbitrary powers the munitions manufacturers were permitted to exercise without restraint by tribunals made up, as the New Statesman put it, of "persons who seem to regard it as a patriotic duty to refuse to listen to the workman's 'excuses,' and to inflict summary and exemplary punishment in every case brought before them."* The London Times admitted that the Act had occasioned some serious friction in important munition areas because of certain details of administration. The composition of the tribunals, the lack of uniformity in wages of women and unskilled men in government factories and in "controlled" establishments, and the administration of the leaving certificate system were the "details" which had aroused the resentment of the workers. The government, however, and the middle and upper classes failed to understand the nature of Labor's grievance and considered it only a petty disloyalty which made workers rebel at

* The New Statesman, November 6, 1915, p. 99.

personal injustice in a time of national crisis.

The Munitions Act thus failed to accomplish its main purpose, namely, the recruiting and holding of workers in sufficient numbers to insure an adequate supply of munitions. Moreover, dissatisfaction does not tend to increase output. The shortsightedness of a policy which permitted workers to be worn out by exhausting conditions, especially at a time when they could not be readily replaced, was brought home anew to government officials. They realized then, too, a thing which was not evident at the beginning of the present conflict—that the war would not be over in a month or a year, and that the health of the workers must be conserved if production was to be maintained over a long period.

Appointment of Health of Munition Workers Committee

The realization of these facts on the part of those entrusted with the task of supplying arms and ammunition for the British forces led to the appointment, in September, 1915, of a committee under the Ministry of Munitions, called the "Health of Munition Workers Committee," "to consider and advise on questions of industrial fatigue, hours of labor, and other matters affecting the physical health and physical efficiency of workers in munition factories and workshops." This Committee proceeded, under the chairmanship of Sir George Newman, Chief Medical Inspector for the Board of Education, and with a membership* well qualified for its duties, to inquire into the

* Sir George Newman, M. D. (Chairman), Sir Thomas Barlow, Bart., K. C. V. O., F. R. S., G. Bellhouse, Factory Department, Home Office, Professor A. E. Boycott, M. D., F. R. S., J. R. Clynes, M. P., E. L. Collis, M. B., Factory Department, Home Office, W. M. Fletcher, M. D., F. R. S., Secretary of Medical Research Committee, Leonard E. Hill, M. B., F. R. S., Samuel Osborn, J. P., Miss R. E. Squire, Factory Department, Home Office, Mrs. H. J. Tennant, E. H. Pelham (Secretary).

actual conditions then prevailing, with a view to making recommendations which would result not only in greater comfort for workers, but also in increased production by a more physically fit and better satisfied labor force. The findings of the Committee have been embodied in a series of memoranda, submitted in November and December, 1915, and in January, July, August, and October, 1916. The subjects of these memoranda may be grouped, for consideration here, under five main heads: (1) hours of labor; (2) health and hygiene; (3) general welfare provision; (4) employment of women; and (5) juvenile employment.

Hours of Labor

Under pressure of the need to increase production beyond any conception of past experience, the first established principle of working conditions to give way was, naturally enough, the restriction of hours. This was the problem, also, which first attracted the attention of the Health of Munition Workers Committee.* The work of the Committee in this field covered the questions of Sunday labor, overtime, night work, rest periods, and holidays, as well as special study of the relation of output to hours of work. The standards set forth in their recommendations do not represent the ideals of the Committee, but are especially adapted to the exceptional emergency, and are based on the expectation that the war will be of long duration.

SUNDAY LABOR: A memorandum on Sunday labor was presented soon after the appointment

* Three memoranda are devoted to a discussion of this subject: No. 1, Sunday Labour, November, 1915; No. 5, Hours of Work, January, 1916; No. 12, Statistical Information Concerning Output in Relation to Hours of Work, July, 1916.

of the Committee, as an interim report, the matter being deemed of such urgent importance that it was thought desirable not to delay its discussion until they were in a position "to deal with other questions falling within their terms of reference."

The Committee found, strangely enough, the great majority of employers opposed to Sunday work. They were beginning to realize that from the administrative end it imposed too severe a strain on the foremen, who were difficult to replace; and, from the economic standpoint it meant higher wages with but slight increase in output and irregular attendance on other days of the week. They felt, also, that in its religious and social aspects "the seventh day as a period of rest" was "good for mind and body." In spite of this attitude on the part of employers, however, Sunday labor had been widely adopted, partly on account of the heavy demands on output and the necessity of taking every means of increasing production, and partly on account of the desire of workers to make the double, or at least increased, pay which was given. In many cases the hours of labor on Sunday were considerably shorter than on other days, but there were still a number of factories where they were as long as on other days, if not longer, as in cases where the change from a twelve-hour day shift to a twelve-hour night shift was made by working for a continuous period of eighteen hours. Permits for Sunday work even for "protected persons" (i. e., women and young persons under eighteen years of age) had been issued for fifty plants to cover women, boys and girls, and for thirty more to cover boys only. These "permits" had often been conditioned on the workers being employed for short hours on Sunday, or on having time off on Saturday. According to the Chief Factory Inspector's report

for the early period of the war, many employers assumed that the labor laws were not binding in the emergency, and disregarded their restrictions without applying for permits. For men, moreover, such permits were not required, and their employment on Sunday was consequently more widespread than that of "protected persons."

Statistics on the output from Sunday labor were not available at the time of the publication of the Committee's first report. One important firm, however, found that by instituting a working week of six rather than seven days, the average weekly hours, instead of being diminished, actually increased from 59¼ to 60, indicating an improvement in attendance on the six work days. Moreover, the hourly output had increased. Many other employers conceded that seven days' labor produced only six days' output, and that reductions in Sunday work had not resulted in any appreciable decrease in product. Even less observant managers had begun to detect the effect of strain on the workers. Employers were realizing the necessity of conserving the workers' strength in order to maintain the maximum output over a longer period than had been at first estimated. The workers too, commenced to feel the need of more rest. The strain was beginning to tell, especially on those who in ordinary times would have absented themselves from work on account of ill health but who now stuck to their jobs. The higher rate of pay for Sunday work had at first made it popular, but the great majority of workers were now disposed to forego the extra money for the sake of the needed rest.

The conclusion reached by the Committee in regard to seven-day work may be summed up as follows:

"The evidence before the Committee has led

them strongly to hold that if the maximum output is to be secured and maintained for any length of time, a weekly period of rest must be allowed. Except for quite short periods, continuous work . . . is a profound mistake and does not pay . . . output is not increased. On economic and social grounds alike this weekly period of rest is best provided on Sunday." After remarking that the need for this relief was greater for "protected" persons than for adult males, and for men on overtime than for those on double shift, the Committee nevertheless recommended "that the discontinuance of Sunday labor should be of universal application and should extend to all classes of workers." Pending a general discontinuance of Sunday work, if immediate change was found difficult, they suggested ways of improvement, such as reducing Sunday hours, giving all workers alternate Sundays off, omitting one or two shifts on Sunday in cases of the triple shift system, or at least discontinuing the eighteen-hour work period in changing from day to night shifts. It was further noted that "foremen and the higher management even more certainly [than the workers] require definite periods of rest," on account both of their heavy burden of responsibility and the difficulty of replacing them. The Committee finally stated that in order to secure any large measure of reform, definite orders to restrict Sunday work might be necessary.

OVERTIME: Overtime, by which is meant a lengthening of the normal hours of work, was the most commonly used and most abused expedient for increasing production, especially in case of skilled men who were difficult to recruit in large numbers. During a large part of 1915 even a week of ninety hours was not uncommon. A tendency to reduce hours of work was apparent, how-

ever, as early as January, 1916, when the recommendations of the Committee were submitted. Still, excessive overtime had by no means disappeared, since seventy and eighty-hour weeks were frequently encountered. While no serious breakdown among the workers was then apparent, the Committee remarked that "it is self-evident that men cannot work continually fifteen hours a day with good effect," and "general statements indicative of fatigue have been received," especially in regard to women and older men. Moreover, the question was not whether the workers had been able to withstand the strain up to that time, but whether they could continue to do so over a long period. The Committee recognized that overtime could not be altogether abolished during the crisis, but felt it was possible to compromise on a course midway between the standards of peace and the extremes to which a shortsighted policy had driven employers and workers. In general they suggested that double or triple shifts be substituted wherever possible for overtime.

For adult males the Committee recommended a maximum working week of sixty-five hours, including all overtime; a concentration of overtime on three or four days of the week which should preferably be not consecutive, and a discontinuance of working from Friday morning all through Friday night and until Saturday noon. For women and girls they recommended that continuous work in excess of sixty hours be discontinued as soon as practicable, since the strain of excessive hours is without doubt even more serious for them than for men.* The need for overtime among women, more-

* The Committee have instituted a series of intensive studies to ascertain more accurately the effect of long hours on health of women. These inquiries are being conducted by women physicians in co-operation with women factory inspectors and the National Insurance Commission.

over, is not so pressing, because of a large reserve of female labor. In regard to boys who are used so widely to assist men, the Committee recommended, "though with great hesitation," that they be permitted the same maximum hours as men, but that substantial relief be provided at week-ends and that those under sixteen should not be made to work more than sixty hours.

INCREASED PRODUCTION WITH SHORTER HOURS: A special study,* published nearly eight months after the first recommendations on hours, supplemented those more general observations, and provided a statistical basis for the conclusions of the Committee regarding the relation of working hours to volume of production. In several large munition plants the output of different groups of workers had been followed over a period of from eighteen to twenty-seven weeks. In the case of 100 women engaged in turning fuse bodies, which is moderately heavy work, a reduction in the average hours worked per week from 68.2 to 59.7 was followed by a 23 per cent increase in hourly output and a rise in weekly output of 8 per cent. This change effected also a decrease of two hours in the amount of "broken" time per week. While this reduction of working hours to sixty a week proved so successful in increasing output, a further decrease showed that an equally large output could be maintained in fifty-six hours or even less. That this remarkable rise in production rate was effected without any change in machinery, tools, raw materials or nature of the operation strengthens the validity of the findings. A possible increase in skill among

* This study was undertaken for the Committee by Dr. H. M. Vernon. The results were published in July, 1916, as Memorandum No. 12, Statistical Information Concerning Output in Relation to Hours of Work.

the operatives during the period studied was another element carefully tested and eliminated by the investigators.

MAXIMUM HOURS FOR WAR TIME: Similar studies were made of other groups of both men and women employed at different kinds of labor. A group of 27 men sizing fuses, a particularly fatiguing process, increased their hourly rate 22 per cent, and their total weekly output 10 per cent when the average hours worked were decreased from 61.5 to 55.4. The general conclusions drawn were that in time of stress, for men engaged in very heavy work the maximum hours from the point of view of high production should be no more than fifty-six hours a week; for men on moderately heavy work, sixty; for men and boys on light work, seventy; for women on moderately heavy work, fifty-six, and for women on light work about sixty hours. It is pointed out, however, that these were maximum hours, that they imposed a great strain on operatives—in many instances one too great to be borne—and that, in fact, they applied only to the "fittest who were strong enough to survive in the struggle, not to the general mass of workers of all classes who tried their hand at munition work." The "best hours for peace times" were considerably shorter in each case, the report stated, but whether it be a case of peace or war, the principle of varying the hours according to the character of the work, and the sex and age of the workers should be observed. The investigators also advocated speeding up the rate of production in order to reduce the number of hours actually worked and the institution of regular rest pauses to break the long five-hour spells.

SHIFTS AND NIGHT WORK: In order to run the munition plants to maximum capacity, multiple

shift systems had been widely adopted. Two kinds of these were found: the double shift of twelve hours each and the three eight-hour shifts. Men workers were almost universally on the double shift, and the Committee saw no reason for change, since there was apparently no very ill effect and the supply of men was too scant to make the three-shift plan feasible. Women were employed sometimes on the twelve-hour shift, sometimes on the eight-hour shift. The recommendation was made that the twelve-hour shift for women be abandoned wherever the difficulties of housing and transit for additional workers could be overcome, that no girls under eighteen should work at night, and that in no case should night hours run over sixty a week. In the case of boys again it did not seem practicable to regulate their hours further, but it was urged that night work be restricted to those over sixteen, and that its effect on individual boys be carefully watched. The Committee, to clear up any misapprehensions as to their attitude on night work go on record as not considering it a good thing in itself, but only as being preferable to excessive overtime. The objections which they set forth are: (1) it is uneconomical, because of the higher wages and lower output; (2) supervision is often unsatisfactory; (3) adequate lighting is difficult; (4) workers cannot secure the necessary amount of sleep during the day; and (5) digestion is deranged by the unwonted meal hours.

REST AND MEAL PERIODS: The common practice in regard to rest and meal periods on the twelve-hour shift was to allow half an hour for breakfast and an hour for dinner if the shift began at 6 a. m., or only an hour for dinner if it began at 7 or 8, the worker being supposed in this instance to have breakfasted before coming to work. In

the latter case the Committee recommended a break in the morning for tea, especially as many workers must travel such long distances to reach their places of employment that breakfast is taken very early and the wait until dinner is too exhausting. At night in many instances only two half-hour periods were allowed. The Committee recommended one hour and one-half hour break, or two periods of three-quarters of an hour, especially for women. On the eight-hour shift it was customary to allow half an hour for meal time, and this they thought was adequate. In their opinion, also, the ordinary factory holidays should not be interfered with, as these allowed needed recuperation from fatigue.

Health and Hygiene

The study of hours of labor led the Newman Committee, as the Health of Munition Workers Committee is often called, inevitably to the consideration of particular problems of health, such as fatigue and industrial disease, as well as the allied topics of work accidents, factory sanitation, and the like.*

INDUSTRIAL FATIGUE: The Committee, in their study of industrial fatigue, went carefully into its causation and its signs and symptoms, the rhythms of action and rest and their relation to the worker's efficiency. Running through the entire consideration of this subject is a recognition of the relation between scientific management and industrial fatigue. The achievements of Germany and

* Memoranda on these subjects are: No. 7, Industrial Fatigue and Its Causes, January, 1916; No. 8, Special Industrial Diseases, February, 1916; No. 9, Ventilation and Lighting of Munition Factories and Workshops, January, 1916; No. 10, Sickness and Injury, January, 1916; No. 14, Washing Facilities and Baths, August, 1916; and No. 15, The Effect of Industrial Conditions Upon Eyesight, October, 1916.

America in this direction are pointed to, and the Committee, looking into the future, ventured to hope "that the study of industrial fatigue and the science of management based upon it, which is now being forced into notice by immediate need, may leave lasting results to benefit the industries of the country during the succeeding years of peace."* Fatigue is defined as "the sum of the results of activity which show themselves in a diminished capacity for doing work," not to be determined in its early stages, at least, by subjective sensations, but by such objective signs as decreased output, spoiled work, accidents, sickness, lost time, or "staleness." Of these tests the most direct is diminished production, and measurements of the output of the shop and the individual worker are suggested as indices. "Slacking," which has been charged against the British workers during the war the Committee believed to have been discontinued to a great extent through patriotic incentive. Moreover, they held that some deliberate "slacking" might actually give an improved output by sparing wasteful fatigue, and go even farther in saying that "it cannot in such circumstances be said that a workman so restraining himself, consciously or unconsciously, is doing more to damage the output on the whole than the employer who has arranged overlong hours on the baseless assumption that long hours mean high output." Evidence is presented from statements of employers indicating that there was slacking, "often quite unconscious," in the twelve-hour shift, which was not found under the three-shift system, and that without this restraint the output for the twelve hours would be even lower. On the whole, the Commit-

* It should be noted that scientific management as alluded to in this report is concerned primarily with motion study. No mention is made of time study combined with motion study.

tee were of the opinion that, although in isolated instances intelligent precautions against fatigue had been taken, munition workers in general had been allowed to reach a state of reduced efficiency and lowered health which might have been avoided had proper attention been given to daily and weekly rests.

An exceedingly valuable scientific study of industrial fatigue which should be mentioned in connection with the work of the Health of Munition Workers Committee was made, not by this Committee, but for the British Home Office, by Dr. A. F. Stanley Kent, and published in two reports.*

The first of these reports described the methods used in working out physiological tests for the presence of fatigue, its degree and the worker's power of recovery. The second presents a comprehensive application of these tests to workers in seven different factories, over periods ranging as long as three and a half months, together with the findings based on the results of these experiments. The most extensive studies made were in a surgical dressings factory and an engineering plant, both subject to extreme war pressure. Dr. Kent's findings all support the recommendations of the Health of Munition Workers Committee regarding the abolition of Sunday labor, reduction of overtime, rest intervals, and the like. The most important evidence for a country at war was that showing the effect of fatigue and overtime on production. It is shown that total daily output may be actually diminished by the introduction of overtime because increased fatigue affects the production not alone of the actual overtime period, but

* Interim Report on an Investigation of Industrial Fatigue by Physiological Methods (Cd. 8056), August, 1915, and Second Interim Report on an Investigation of Industrial Fatigue by Physiological Methods (Cd. 8335), August, 1916.

of the regular working hours as well. One group of workers made an absolute increase in output of over 5 per cent, as a result of shortening their working day from twelve to ten hours. Unsatisfactory output during the early morning period (6 to 8 a. m.) was attributed largely to lack of rest, food, and to general discomfort in home conditions, due, though indirectly, to excessive hours of labor.

SICKNESS AMONG WORKERS: The two factors of sickness and injury often indicate the presence of industrial fatigue. In relation to both of these problems the Newman Committee formulated programs for prevention and treatment. After pointing to the relation between bad industrial conditions and ill health, the Committee urged that employers give special attention to guarding against cramped posture at work, prolonged or excessive muscular strain, poor ventilation, heating and lighting, exposure to poisons, gases and dusts, and, of course, against excessively long hours, especially at night. Personal hygiene on the part of the employe was also emphasized as of importance, both to him and to his fellow workers. A system of record-keeping was recommended for absences, sicknesses, and deaths, as a valuable index of the health of the workers. In one munitions plant with a force of 36,000, where such records were kept, it was found, in a study of two departments, that the sickness rate among men working overtime was 5.5 per cent as against 3.7 per cent among those on double shift. In one of these departments, among 1,000 men on overtime the rate was as high as 8 per cent. The monthly sickness rate for the entire plant rose from 2.9 per cent in July, 1914, to over 4 per cent in the first quarter of 1915, and in another large plant the rate had risen to 7 per cent. These increases were

attributed to overtime, night work, and the large number of new employes.

As part of a program of prevention, a preliminary medical examination was recommended for all workers, and in special departments and danger zones a periodic examination as well. In some plants this was the practice, and had been found to be of great advantage. Such a program by which unfavorable working conditions should be reduced to a minimum represent the preventive side of the the Committee's recommendations. For cases of actual sickness they advised medical and nursing resources for each plant.

ACCIDENTS: On the side of accident prevention the Committee recommended, of course, the guarding of machinery, the adoption of safety appliances, the regulation of dangerous processes, adequate lighting of the shops, and careful cleaning of machinery. To further the co-operation of employes in avoiding accidents they advocated the forming of committees of workers to investigate all accidents occurring in the departments in which they are at work. Employes should also be instructed in regard to accidents by a vigilant foreman and through the distribution of leaflets and the posting of placards; and a certain number in each department should receive training in first aid.

Since injuries in munition factories occur almost inevitably because of the dangerous nature of the work, provision should be made for their prompt and effective treatment. More careful attention should be given to minor injuries which now often go untreated and frequently develop serious complications. For these, local dressing stations were suggested, and for the more serious accidents a central room with more elaborate equipment. Full records should be kept of accidents and of their treatment.

The urgent necessity for such provisions in munition plants was emphasized by figures supplied by certain representative shops, showing the frequency of accidents under the present abnormal conditions. In eleven plants employing a total of about 38,000 workers, 35,000 surgical dressings had been performed during the first ten months of 1915. In still another munition factory, during the fall of 1914, when working hours were from 8 a. m. to 5:45 p. m., an average of 100 first-aid dressings were performed each month per 1,000 employed, while in 1915, for the same period, on the day shift from 8 a. m. to 8 p. m., the average rose to 292 per 1,000 and on the night shift from 8 p. m. to 8 a. m., to 508.

INDUSTRIAL DISEASES: Industrial diseases constitute a special phase of the health problem in the manufacture of munitions and have been a cause of serious concern to the Health of Munition Workers Committee.* The most important poisons to which workers in this industry are exposed are lead, tetrachloride of ethane, nitrous fumes, tetryl, fulminate of mercury, and tri-nitro-toluol. Lead is used in making bullets, and in various subsidiary processes; tetrachloride of ethane, an ingredient in the varnish applied to the wings and bodies of aeroplanes, has been discovered only since the beginning of the war as an industrial poison; nitrous fumes are involved in the manufacture of almost all explosives; tetryl, fulminate of mercury, and the highly explosive T.N.T. (trinitro-toluol), of whose double dangers munition workers have learned so much, are all three used in making powders, but they may cause poisoning even in handling the powder in loading shells or primers. The first three of these poisons are the

* Health of Munition Workers Committee, Memorandum No. 8, Special Industrial Diseases. London, February, 1916.

more dangerous because they cause serious, or even fatal illness. The last three cause skin affections, active dermatitis or eczema, and often more serious disorders. Certain fluids used in lubricating and cooling metal may also cause eczema. In the case of fulminate of mercury, regarding which complaints have been made by workers in such an important American munitions center as Bridgeport, Conn., eczema is the usual affection, but mercurial poisoning, which is even more serious, may occur.

For each of the poisons mentioned a description of the resulting disease has been given by the Committee as well as measures for prevention and treatment. Provision of proper washing facilities and of protective overalls, periodic medical examination, transference to other work of those readily affected and the reduction of the period of exposure through the absence of overtime are recommended as general steps to avoid industrial poisoning. Exhaust ventilation was advocated for drawing off fumes and dust; the wearing of respirators as a protection against dust that cannot be carried off by exhausts or allayed by wetting; emergency helmets provided with a supply of fresh air from without for those exposed to escaping fumes; head coverings for women and gauze veils to protect the faces of workers against poisonous dust. As further general preventive measures, it was urged that only healthy and temperate persons be employed, and that none exposed to poisons be permitted to begin work without having taken food.

WASHING FACILITIES: The importance of washing accommodations has been strongly emphasized by the Committee not only for workers engaged in processes involving poisons or excessive heat, dust or dirt, but for the good health, efficiency and

self-respect of the entire force. One of their memoranda* offers practical suggestions as to the most suitable arrangements, both for washing facilities and for baths.

VENTILATION, HEATING AND LIGHTING: At a time when so large a number of new plants were being erected and old ones enlarged, it was also fitting that the importance of ventilation, heating and lighting should be emphasized. This has been done by the Health of Munition Workers Committee in pointing out the close connection between proper provision for these three elements in factory construction and the maintenance of maximum output by the worker. Suggestions regarding modern standards and methods were made by them in considerable detail.†

EYE-STRAIN: Closely connected with the problem of lighting factories was the prevalence of eye-strain and the danger of eye accidents among munition workers.‡ Eyesight may be impaired through exposure to intense heat, to industrial poisons, or through "uncorrected errors of refraction." Special inquiry has revealed a large increase not only of eyestrain, but also of eye injuries among munition workers since the beginning of the war, many of which were preventable. For example, the wearing of proper guards or goggles protects the eyes from flying particles and colored glass lessens irritation where there is exposure to brilliant light, as in acetylene welding.

The eyesight of operatives who are to be engaged on fine work should be carefully tested and, in case of slight accident, first-aid treatment be

* Health of Munition Workers Committee. Washing Facilities and Baths. Memorandum No. 14. London, August, 1916.

† Ibid. Ventilation and Lighting of Munition Factories and Workshops. Memorandum No. 9. London, January, 1916.

‡ Ibid. The Effect of Industrial Conditions Upon Eyesight. Memorandum No. 15. London, October, 1916.

provided to prevent serious after-effects. Since eye-strain is often concomitant with general fatigue, it is bound to accompany overlong hours, night work and undernourishment. Hence we have again a plea—and a reason—for the improvement of working conditions in general.

General Welfare Provision*

In addition to the factory environment and the length of the work period, other factors which do not come ordinarily within the jurisdiction of the management, distinctly affect the efficiency of workers. Housing, transportation, canteens, and the welfare of individual workers are the most important among them. The Newman Committee very strongly recommend that through the appointment of welfare supervisors employers should endeavor to control any detrimental effect on the workers of poor housing, undernourishment, and unfavorable living conditions.

HOUSING OF WORKERS: The sudden influx into districts surrounding munition plants has greatly overtaxed the housing accommodations. In many instances, dwellings intended for one family are occupied by several, and beds are used in day and night shifts. Before any comprehensive plan for the increase of housing accommodations is undertaken, inquiry is recommended into the extent of the need, but pending action, the welfare supervisor can help matters by keeping a register of available houses and lodgings, by aiding workers in need of rooms, and by notifying the management when the supply is insufficient.

TRANSIT: Because of the housing shortage, many workers are forced to live at considerable

* Health of Munition Workers Committee. Welfare Supervision. Memorandum No. 2. London, December, 1915.

distance from their places of employment. Traveling to and fro in overcrowded cars and trains, losing time by waiting, making long and tiresome journeys, which further extend an overlong day or night of work, decrease both efficiency and resistance to disease. Workers were found who left their homes daily before 5 a. m. and returned at 10 p. m. or later, leaving little more than six hours for sleep—and family life. The Committee suggested that the welfare supervisor ascertain the means of transit used and the length of time spent in traveling, indicate the need for increased transportation to the right authorities and suggest modification of factory hours to suit existing transit conditions.

INDUSTRIAL CANTEENS: "The munition worker, like the soldier, requires good rations to enable him to do good work." This fact the Committee recognized in their recommendations regarding canteens in the large war supply factories.* In one of their earliest reports, they pointed out the difficulty encountered by employes in securing good food, when the employer has made no provision, and urged the establishment of industrial canteens in all plants, but especially when workers are employed in large numbers at night and are unable to go home for a hot meal. They made suggestions regarding dietary, cost of food, the best type of canteen to adopt, as well as its management. It was conceded that it might be desirable in certain districts and under restrictions to sell alcoholic liquors.

Attention was also given to the actual physical construction, location and equipment of industrial

* Industrial Canteens No. 3, November, 1915; Canteen Construction and Equipment, No. 6, January, 1916; and Investigation of Workers' Food and Suggestions as to Dietary, No. 11. July, 1916, London.

canteens. A study of typical meals furnished to munition workers in industrial canteens, served in restaurants or brought by them from home was undertaken for the Newman Committee by one of its members, Mr. Leonard E. Hill, in the laboratories of the Medical Research Committee. In his report Mr. Hill stressed the relation of both physical and nervous fatigue to the workers' daily diet, and with his analysis of the meals examined as a basis, made suggestions for a "well-balanced minimum" dietary for canteens.

INDIVIDUAL WELFARE: Aside from the help the supervisor can render in solving problems of housing, transit, and food, even greater service can be given in matters concerning the individual welfare of the worker which will be reflected in the efficiency of the labor force. Such functions include attention to cases of sickness or irregular attendance at work in co-operation with the medical staff, observation of individual reactions to night or Sunday work or overtime, planning for recreation and education, and the maintenance of proper discipline and conduct. Moreover the Committee were emphatic in their indorsement of welfare work and recommended especially the appointment of women supervisors where women and girls are employed.

Employment of Women

Although the problems discussed in all the memoranda of the Health of Munition Workers Committee affect women as well as men, the employment of women since the outbreak of the war has grown to such dimensions that a special report has been devoted to recommendations in this field.* The response of English women of all

* Health of Munition Workers Committee. Memorandum No. 4, Employment of Women. London, January, 1916.

classes to their country's call has been one of the finest things of the war. Women of wage-earning experience and those of none—university and art students, teachers, secretaries, domestic servants, clerks, laundresses, textile workers—old women and young, married women and single, in a splendid spirit of patriotism, have all volunteered in the army of labor, and because of their enthusiasm achieved remarkable success. In September, 1916, the War Office published a report on Women's War Work "for the use of recruiting officers, military representatives and tribunals." It lists some twenty-five pages of processes in which women have been successfully employed in "temporary" replacement of men, and in a large number of photographs shows them engaged in such heavy jobs as coal-heaving, stoking, boiler-making, cleaning locomotives and other work which they have never before been called on to do. Not alone have women taken up men's tasks willingly but they have accepted without complaint conditions which were immediately detrimental to efficiency and which would, if continued, be disastrous to health, and this at a time above all times when the health of the present and future mothers of the nation should be safeguarded.

Night work for women, especially in the munitions industry, has been revived after almost a century of disuse, and employment of married women and of young girls has, of course, increased. Hence it is of great importance to safeguard their period of employment. The Committee realized that in the emergency night work was inevitable, but urged that its evils be mitigated by careful supervision, by the provision of sufficient pauses for rest and meals, and where desirable, by periodic change to the day shift. During the meal hour on the twelve-hour night shift women were

found asleep beside their work, too exhausted even to go to an attractive mess room to get the food to sustain them during the remaining hours of the night. The recommendations for hours, shifts, overtime, and rest pauses, for women workers are substantially the same as those already given in the section on hours of work.* Employment of mothers with infants was deprecated by the Committee, and the need of consideration in arranging hours of work for married women was urged.

The questions of housing and transit were also given further attention in relation to women's employment. Many women were forced to spend two and three hours traveling each way to and from work. This often meant "a day begun at 4 or even 3:30 a.m., for work at 6 a.m., followed by fourteen hours in the factory, and another two or two and one-half hours on the journey back," ending finally "at 10 or 10:30 p.m., in a home or lodging where the prevailing degree of overcrowding precludes all possibility of comfortable rest. Beds are never empty and rooms never aired, for in a badly crowded district, the beds, like the occupants are organized in day and night shifts."† Moreover cars were so crowded that the women's clothes were often torn in the struggle to get even standing room. There was, therefore, crying need for increased transportation which would also relieve the housing situation. But even with improved transit long journeys cruelly extended the day. Hence it was all the more necessary to guard against excessive working hours.

Good sanitary conditions in the factories are especially important for women wage-earners.

---

* See pages 12-16.

† Health of Munition Workers Committee. Memorandum No. 4, Employment of Women, p. 5.

Workrooms should be clean, bright and airy, well warmed in winter and well lighted at night; cloak rooms, washing facilities and sanitary conveniences should be provided. For the protection especially of those unaccustomed to factory work, the lifting or carrying of heavy weights and the strain of prolonged standing should be avoided. It is recommended also that a woman physician examine all applicants for employment. Careful oversight by forewomen, nurses, and women welfare supervisors in the fields of work, health and general well-being was a point much emphasized. In conclusion the Committee stated that in their opinion if the present conditions surrounding the employment of women continued, "it would be impracticable to secure or maintain for an extended period the high maximum output of which women are undoubtedly capable."

Juvenile Employment

Special attention has been given also to the problems of child labor in war time.* The Committee declare that: "At the present time, when the war is destroying so much of its best manhood, the nation is under special obligation to secure that the rising generation grows up strong and hardy both in body and character. It is necessary to guard not only against immediate breakdown, but also against the imposition of strains which may stunt future growth and development." Such strains were found in the long hours of work, by day and by night, sometimes through seven days in the week, in the poor housing and transit facilities and in the often unsatisfactory home conditions. Factory inspectors bore witness to the more

* Health of Munition Workers Committee, Memorandum No. 13, Juvenile Employment. London, August, 1916.

marked fatigue produced by overtime and night work on the adolescent than on the adult worker, a menace not only to present health but to growth and physical development. Moreover these children had no leisure, no recreation, no opportunity for continuing their education. Exemptions from the legal age limit of fourteen had been permitted,* and a case cited in which boys of thirteen were allowed to work full time in a large munition center, provided they attended evening school. The Committee pointed out that it was worse than useless to require such attendance for boys who worked from 6 a.m. until 5 p.m. or longer.

The problem of boy labor seemed more pressing to the Committee than the employment of young girls, since boys, who to a great extent were employed to assist men, worked the same hours as men. Moreover boys under sixteen are said to be even more delicate than girls of the same age.

The recommendations regarding hours are similar to those already given. Boys should be permitted, if the work requires it, and conditions of employment are favorable, to work more than twelve hours a day up to a weekly total of 65, but the overtime should be concentrated on three nonconsecutive evenings of the week. One day's rest in seven should be assured. Night work should be permitted for boys under sixteen and girls under eighteen only when no other labor can be obtained. Because of the greater adaptability of youth, it was thought, when found absolutely necessary to employ them at night, that they would suffer less

* In March, 1916 it was reported in Parliament that 8,026 children under fourteen had been released from school by the Board of Education since the beginning of the war in order to go to work. Only 92 of these were girls. More than half of the entire number were under thirteen. It was claimed that the majority of these children were employed in agriculture.

from weekly alternation of day and night shifts than adult workers. Furthermore as young persons cannot profitably work for a continuous spell of five hours (the maximum legal period), short rests should be allowed, and time for refreshment when breakfast has necessarily been taken early. Not only should the ordinary holidays be granted, but when possible, vacations of a week or more.

The situation is further complicated for young workers by overcrowding and bad home conditions. One large munitions center revealed numerous cases in which three people slept together in one bed. A case said to be typical was described, in which a boy of fourteen slept in a bed with two young men, while in the same room two young girls slept in another bed. Because of the absence of fathers at the front parental control was often weakened. After a long day of work many children were tempted to stay out late at the movies or to dance, and their high earnings induced thriftlessness. Moreover an increase in juvenile crime had become so marked, according to comments in the press, that the Home Secretary had called a special conference of social workers to deal with it. The Newman Committee recommended special welfare workers for boys and outlined in detail the duties of the "Boy Visitor." He should watch carefully the physical condition of the boys, visit them when sick, investigate other causes of irregular attendance, receive and dispose of complaints made either by employers or boys, advise before any case of dismissal, look into conditions of housing, transit and dietary, plan recreation and promote plans for saving.

SUMMARY OF RECOMMENDATIONS

The reports of the Health and Munition Work-

ers Committee give evidence of an enlightened and common-sense attitude toward the industrial problems which the war has created. A headlong, unthinking policy of blind haste had at first led to the needless waste of precious human strength. This panic has now given place to a realization of the fact that increased output is to be gained through the saving of the workers' health and strength, and an increase in the labor force, not through the taxing of endurance to the breaking point. But there is still need to hold up standards. These standards, as outlined by the Committee, may be summarized as follows:

I. HOURS OF WORK:

a. SEVEN-DAY LABOR should be abolished for men, women and children.

b. Excessive OVERTIME should be done away with by the introduction of shifts.

c. HOURS OF LABOR should be adapted to the age and sex of the worker and the nature of the process to be performed.

d. NIGHT WORK, where possible, should be organized in eight-hour, rather than twelve-hour shifts, and in no case should women work at night more than 60 hours a week. Its evils should be further mitigated by sufficient rest periods and by periodic change to the day shift.

e. MEAL PERIODS should be at least an hour in length on twelve-hour shifts, and half an hour on eight-hour shifts. Further breaks should be allowed in long five-hour spells.

II. HEALTH AND HYGIENE:

a. INDUSTRIAL FATIGUE should be decreased by a careful study of processes

of work and of the most economical method of accomplishing them.

b. Provision for both prevention and treatment of WORK ACCIDENTS, INDUSTRIAL DISEASE, and other ILLNESS, should be made in all munition plants.

c. Matters of factory SANITATION such as ventilation, heating, lighting, and washing facilities should receive especial attention.

III. GENERAL WELFARE:

a. Improvement of HOUSING and TRANSIT facilities should enlist the co-operation of employers.

b. In the interests of health and efficiency, all munition works should have CANTEENS where employes can secure hot food.

c. The appointment of WELFARE SUPERVISORS is recommended in all factories.

d. Problems involved in the increased employment of women and children should receive the careful attention of both managers and the government. Special welfare workers should be assigned to their oversight.

SUBSEQUENT CONDITIONS

Unhappily the Newman Committee on the Health of Munition Workers have not seen all their recommendations adopted. The newspapers did not give publicity to their findings until some time after the reports were actually submitted, and they were then subordinated to matters of greater popular interest. Furthermore, while the government could make changes in the factories it owned, control over private establishments, which are in the majority, was not so complete.

Some definite progress has been made, however, in relieving the conditions which were the special point of attack in the memoranda of the Committee. Sunday labor has been decreased through a recommendation issued by the Minister of Munitions in January, 1916, which was practically tantamount to a command, that Sunday labor in "controlled" establishments be abolished. As a result it was reported in Parliament on March 30, 1916, that in 2,400 works inspected, 60 per cent had no Sunday work, and of the other 40 per cent, many were engaged only in repair work and others were manned by voluntary week-end workers. The attempt to relieve the strain on regular employes of Sunday work has led to the recruiting of a special force of week-end workers, made up largely of women of the leisure class, who volunteer their services for Sunday in order that the factories may be kept running and the regular workers released for rest. Dukes' daughters and generals' ladies, artists and authors, students and teachers, ministers' and lawyers' wives, make up the membership of the picturesque W.R.M.W. (Week-end Relief Munition Workers). They are paid at the current rates, and are "voluntary" only in the sense that they offer to work of their own free will.

No definite ruling regarding daily hours of work seems thus far to have been issued by the Ministry of Munitions, but in association with the Home Office it has formed a committee to regulate hours as well as to secure a weekly day of rest for the workers. The effect of this step and the vigor of its prosecution has been difficult to ascertain, but the tendency has probably been to reduce the amount of overtime. As late as October 22, 1916, an article which passed the censor and appeared in the New York Times, stated that in the Wool-

wich arsenal, which employs 50,000 men and 17,000 women, the latter "work day and night in two shifts of twelve hours each, with a break of an hour for dinner and of half an hour for tea." If the long shifts still obtained in one of the largest government plants, the probability was not strong that the privately owned plants even with government control, had gone much farther in introducing shorter hours. In August, 1916, in response to a question put in Parliament Dr. Addison of the Munitions Ministry stated that the special joint committee on hours was taking steps to bring the hours for women and girls in controlled establishments within the sixty-hour limit allowed under the ordinary provisions of the Factory Acts. In April, 1917, it was reported by a former investigator for the Newman Committee that in government-owned munition plants women were working universally on eight-hour shifts.

The recommendation of the Newman Committee that the ordinary "bank" holidays should not be interfered with was given a trial at Easter in 1916, but Lloyd George, then Minister of Munitions, claimed that in the fortnight which included Easter Monday the output had been decreased one-half. As a consequence, and also because of the extra need of munitions for the great offensive on the Somme, the customary holidays at Whitsuntide and in August, were not granted, though pains were taken to make it clear that this was a postponement and not an abandonment of these holidays.

Definite efforts have been made on the part of the government to carry into effect the recommendations of the Committee in regard to industrial canteens. A Canteen Committee was appointed by the Central Control Board (for liquor traffic),

in conjunction with the Munitions Ministry, to assist firms in the construction and financing of canteens. In June, 1916 it was reported that canteens had been established in practically all the 75 government-owned factories, and that in the 3,500 "controlled" works the government had encouraged their introduction by subsidizing them, either through permitting employers to pay the expenses out of profits that would otherwise have reverted to the national treasury, or by contributing half the costs incurred by voluntary agencies such as the Young Women's Christian Association, in establishing an industrial canteen. The Canteen Committee also published in October, 1916, a pamphlet on Feeding the Munition Worker, as a "comprehensive and practical guide" to canteen construction and management.

Another important step affecting the general well-being of the workers was the establishment of a special Welfare Department under the Ministry of Munitions, to stimulate the development of welfare supervision in the war factories. This department, under the superintendence of Mr. B. S. Rowntree, also undertakes inquiries into working conditions, including hours of work and wages, endeavors to correct evils where they are found, encourages the provision of rest rooms and canteens, and through a special private fund furnishes the means of "healthful and invigorating" recreation. The appointment of at least one woman welfare worker in each national plant is now required, and many controlled factories are following suit. Excellent results are said to have followed from the activities of these supervisors.

Some attempts have also been made to relieve the housing situation in a few large munition centers, such as Sheffield and Woolwich, where the government has either financed or subsidized the

building of houses and of temporary "huts" and hostels. Dr. Addison, of the Munitions Ministry stated in August, 1916, that accommodations for 60,000 persons had been provided in the year previous and in some cases whole villages had been built.

In a general way, also, the work of the Health of Munition Workers Committee has improved industrial conditions. Public interest has been directed toward abuses, and a more intelligent attitude created in regard to sources of labor difficulties. The dissatisfaction of labor, however, has been by no means eliminated, despite the fact that the Munitions of War Amending Act, passed in January, 1916, remedied the worst evils of the leaving-certificate system and of the administration of the munitions tribunals. The "dilution" of labor has progressed so far, and the attitude of both employers and the government has been such as to make the trade unions fear that after the war it will be well nigh impossible for them to restore their ante-bellum status. Plans to mobilize the whole population for national service, civil as well as military, on a scale more comprehensive than ever before, are now being pushed forward with vigor by the new Lloyd-George ministry, and to make this mobilization effective the club of industrial conscription is being held over the heads of the British people. In the face of the apparent weakening of their powers, however, the unions are claiming large gains in numbers and in strength, not alone among women, but also among men, despite the heavy inroads which the call to the colors has made in their membership.

The most immediate problem facing British labor at present, however, is the question of wages. The cost of living is soaring and wages in many cases have not kept pace, notably among

women. The Munitions of War Amending Act of January, 1916, authorized the Minister of Munitions to enforce minimum wages for munition workers, but no action was taken which affected the large body of women until July, 1916, when a wage order* was issued which was designed to do away with the sweating of women. This order has aroused considerable antagonism in labor circles because its minimum rate becomes in effect the maximum. The rate is fixed at 4½d. an hour for women of eighteen years or more employed at work customarily done by women. Women who have replaced skilled men (about 1 per cent of those employed on munition work) are paid at the same piece work prices as men, although, according to a prominent trade union man, because they cannot turn out as much work, their earnings are only about 75 per cent of what men make. The wage for women who have replaced semi-skilled or unskilled men is fixed according to an earlier order issued in May, 1916, at a time rate of one pound a week. A pound now has no more purchasing power than 12 shillings had before the war; and that sum had been commonly recognized as a sweated rate for women in industry.

Difficulties are being somewhat overcome, however, partly through concerted effort and partly through a natural readjustment to what, it is now apparent, will be a prolonged struggle. Credit should be given to the English government for its great achievement in industrial organization during the past year and a half, and for its recognition of the importance of the human element in efficiency of production; but there is still need to remember that in a long race it is endurance, not sprinting that wins.

---

* This is Statutory Order No. 447.

MUNITION WORKERS IN FRANCE

As Described by a British Commission

France had been far more successful than England in increasing her output of munitions during the first year of the war. In spite of the fact that one-eighth of the country and five-eighths of the former "metallurgical productivity" were in the hands of the enemy, her manufactures had been enormous. The response to her call for workers had been both more enthusiastic and more immediate than England's.

It was, therefore, natural that the British government should turn to her ally for guidance, and in November, 1915 the Director-General of Recruiting for Munitions Work in England appointed a commission of four members* to visit the industrial districts in France and report upon the causes which had contributed to the enormous increase in the production of munitions in that country. The commission visited 23 factories in different centers of the industry. A month later, in December, 1915, it made its report† giving a concise account of the conditions prevailing in these factories.

---

* J. T. Brownlie, Chairman of Amalgamated Society of Engineers and member of National Advisory Committee and the Central Munitions Labour Supply Committee; Alexander Duckham, Ministry of Munitions; D. J. Shackleton, Labour Adviser, Ministry of Munitions; Allan M. Smith, Secretary Engineering Employers' Federation and member Central Munitions Labour Supply Committee. Two engineers experienced in munition manufacture in Great Britain were attached to the Commission.

† Ministry of Munitions. Report by Mission Appointed by the Director-General of Recruiting for Munitions Work. Output of Munitions in France. London, 1916.

One of the features of French organization they found to be the prevalence of the small producer. There were 1,800 of these in the Paris district alone. The work done in these small shops was let out on sub-contract by the large producer. The small French shops are often manned by the members of a single family who divide the work on their inadequate machinery into day and night shifts. Despite the many handicaps their production was surprisingly satisfactory, but from stories told it was apparent that serious overwork, due to a spirit of self-sacrifice, occurred frequently in these small establishments. One woman, whose husband was at the front, literally worked herself to death in superintending his shop, and he was then recalled from the army to take her place.

Another feature of factory organization was the high degree of specialization in product in each plant, which resulted in an increase of repetitive work involving less need for skill, greater speed, and decrease in the amount of tool room and inspection work required.

Apparently the English system of government and "controlled" factories had not been adopted. New factories had been erected, old ones extended, and others adapted to the manufacture of munitions, but in spite of the remarkable increase in number of plants none had received either a subsidy or a loan from the government.

The Commission gave high praise to the well-planned lay-out of the new and remodelled shops in avoiding congestion and in providing extra facilities for the transport of material, as well as to the initiative and energy displayed by French man-

ufacturers in importing large quantities of new machinery.

Military Labor in Factories

In the munition factories a large proportion of the male labor is military, many of the men being those who are not physically fit for active service, but who are still mobilized and under military law. Any attempt in England to employ soldiers in munitions plants under military law has met active opposition by the trade unions, who considered it nothing less than industrial compulsion. But France had had no counterpart of England's difficulties with trade unionism. There have been no strikes, no demands for general wage increases, or for the limitation of employers' profits, no opposition to the "dilution" of labor or to the suspension of union rules of hours and wages. This lack of friction may in part be due to the fact that a large number of the workers are subject to military discipline. The Commission were inclined to impute it, however, to the intense patriotism of the French.

Hours of Work

The same general schedule of hours for munition plants prevailed in France as in England—that is, the more common double shift of twelve hours as well as the three eight-hour shifts. However, because of an absence of overtime beyond the regular schedule and because of a long break at noontime, customary in the working day in France, which averages an hour and a half and is sometimes two hours, there was no evidence of fatigue. The intensity of production and the almost entire absence of lost time were the two tests by which this conclusion in regard to fatigue was reached. In addition to the fact that overtime was not worked, the change from day to night

shift, or vice versa, which is made every two weeks, gave the workers twenty-four hours off.

The customary starting hour for the day shift was 6 or 7 a.m. Ten to twelve hours are worked on this shift, and nine and a half to eleven on the night shift.* The night shift began at 6, 7 or 8 p.m., and ran through to 5, 6, or 7 a.m., according to the time of starting. The rest period at night was often shorter than in the day time, being usually one hour, and sometimes, though rarely, as short as half an hour, in which case the time was paid for and the machines were not stopped. It was claimed that night production equalled and sometimes excelled that on the day shifts. Where the three-shift plan has been adopted, there is no break whatsoever for meals, but "in some cases light refreshment is taken while the work proceeds."

Two schedules for the triple shift were found in use. According to the first schedule the first shift ran from 6 a.m. to 2 p.m., the second from 2 to 10 p.m. and the third from 10 p.m. to 6 a.m. On the other schedule the shifts ran from 4 a.m. to 12 noon, from 1 p.m. to 9 p.m and from 8:45 p.m. to 4:15 a.m. Saturday hours on double and triple shift systems were the same as those on other days, but in some cases work stopped at noon on Sunday.

SUNDAY WORK: No statement was made as to the prevalence of Sunday labor, but by implication the impression was conveyed that at least part of Sunday is commonly a working day. The change from day to night shift, however, gives a twenty-four hour rest period every other week.

LOST TIME: Lost time is dealt with severely when it is due to avoidable causes, and this may

*The mean hours on day shift are 10 hours, 45 minutes, and on night shift 10 hours, 10 minutes.

account for the strikingly small amount which occurs. A first offense on the part of a civilian brings a reprimand, a second sometimes a fine, but more often dismissal. Military workers are dealt with under military law.

Wages

The question of wages which did not come within the jurisdiction of the Newman Committee were dealt with in the report of the Commission to France. Piece rates were paid for almost every type of work, and women received the same rate as men. During their period of training, however, workers were paid a time rate, usually the guaranteed minimum. The premium bonus system was not in use anywhere. Some average daily earnings are given in Appendix C of the report. For men, the averages* ranged from 6.01 francs per day for laborers to 10.42 francs for machine men and 12.23 francs for skilled workers. For women, the minimum was 3.53 francs and the mean 5.95. These earnings, while low compared with American wages seem to be somewhat in excess of wages paid in France before the war† for work of a similar nature, although the Commission itself makes no comparison. But food prices and the cost of living generally have advanced so much that the slight increase in wages does not in any way compensate for the added drain on expenditures.

* These averages are averages of the mean earnings per shop and are not weighted according to the number of employes per shop.

† In 1911, in a report published by the French Minister of Labor on wages and cost of living, the mean daily earnings for day laborers was 5 francs in Paris, and 3.26 francs in other cities; for metal workers 8.25 francs in Paris and 5.39 in other cities; for iron founders 10 francs in Paris and 5.12 in other cities. In women's occupations, such as millinery, the mean daily earnings were 5 francs in Paris and 2.48 in other cities; for dressmakers 3.50 francs in Paris and 2.28 in other cities.—Ministère du travail et de la prèvoyance sociale. Salaires et coût de l'existence à diverses époques. Paris, 1911. pp. 22-23.

Moreover the minimum earnings for women are somewhat below the weekly minimum urged for English women in munition factories and finally secured for one group of them, at least—namely, 20 shillings.*

THE WOMEN WORKERS

The employment of women, of course, receives special consideration in any discussion of war work. As in England, French women have been drawn into the munitions industry from all employments and from non-industrial life. An interesting table is presented in Appendix B of the report, showing the former occupations of women employed in one large plant and the processes of work on which they are at present engaged. Housewives, domestic servants, artists, hairdressers, clerks, florists, dressmakers, typists, weavers, milliners, school teachers, lace makers, those "of no profession," and many others are listed. Housewives formed over 20 per cent of the women employed, and in several departments actually constituted the predominant group.

The work done by women covered practically all processes. At the time of the visit of the Commission, they were beginning to be employed even at some parts of setting up and tool making, including the grinding of tool edges. It was thought by some of the members of the Commission, however, that some of the work done would be considered in England to involve too severe a strain. Women's output on "small work" equalled and in some cases even exceeded that of men, while on the heavy work, for the most part, their productive power was of practically equal value. Their hours of work were substantially the same, except

* The minimum for French women in the English money equivalent for a six-day week is 15s. 6d. and for a seven-day week 18s. 1 d.

that there was a tendency to employ but few women at night, which had under the double shift plan resulted practically in a day shift for women and a night shift for men. Under the three-shift system, however, women were employed at night, and the tendency was toward their more frequent employment at night on the double shift as well. An effort to overcome the fatigue from congested transit was shown by the custom of permitting women who were obliged to ride to and from work to begin fifteen minutes later than men, and leave fifteen minutes earlier.

For the most part, good sanitary conditions were found in the French shops, as well as adequate washing and locker facilities. Several factories supplied caps and overalls for women. No other provision, however, against exposure to industrial poisons or accident, nor for medical service within the factories was mentioned. Some firms had woman superintendents of discipline, in addition to forewomen, but employers were divided in opinion as to the desirability of such a plan.

Technical Instruction of Workers

No provision had been made by the French government for the technical instruction of unskilled men and women, and the necessary training was given therefore in each factory. The average period of training for women on machines was a week, though it ranged from less than one day to a fortnight. A man often taught a woman who then took his place, taught another woman, and then was replaced as a teacher by her pupil.

Cause of Increased Production

The Commission gave the highest praise to both employers and workers. They believed that the patriotic spirit of both sides was responsible for

the good timekeeping of workers, for freedom from trade union restrictions, and for increased intensity of production. Employers too had stopped at nothing to get the most adequate equipment. While as has been stated, no official limit had been put on profits, as in England, neither had there been any demand for it made by workers. This freedom from restraint and the greater incentive for gain may have reacted favorably on the output of munitions.* Though several incidental factors were mentioned as in part responsible for the enormous manufacture of war materials, the success was attributed almost wholly to the splendid spirit of devotion to the French cause shown by workers and employers. The final conclusion of the report, despite the presence of a trade union member on the commission, makes by implication a thrust at English labor. It states that "the people of France realize that they are at war, that their one idea . . . is to bring the war to a successful issue," and that, furthermore, the increase of production is due to one cause, and one only, and that is—patriotic enthusiasm.

* A recent newspaper item, however, states that a committee of the French Senate have brought charges against French munition manufacturers of excessive profits made on government contracts.

BIBLIOGRAPHY

Books and Reports

Cole, G. D. H. Labour in War Time. London, 1915.

Great Britain. Central Control Board. (Liquor Traffic). **Canteen Committee.** Feeding the Munition Worker. London, October, 1916.

——— ——— **Home Office.** First and Second Interim Reports on an Investigation of Industrial Fatigue by Physiological Methods, by A. F. Stanley Kent, M.A., D.Sc., London, August, 1915 and 1916.

——— ——— **Home Office.** Annual Reports of the Chief Inspector of Factories and Workshops for the Years 1914 and 1915. London.

——— ——— **Ministry of Munitions.** Notes on the Employment of Women on Munitions of War, with an Appendix on Training of Munition Workers. London, February, 1916.

——— ——— **Ministry of Munitions. Health of Munition Workers Committee.** Memoranda 1-15. London, 1915-1916.

1. Sunday Labour. 2. Welfare Supervision. 3. Industrial Canteens. 4. Employment of Women. 5. Hours of Work. 6. Canteen Construction and Equipment (Appendix to No. 3). 7. Industrial Fatigue and Its Causes. 8. Special Industrial Diseases. 9. Ventilation and Lighting of

Munition Factories and Workshops. 10. Sickness and Injury. 11. Investigation of Workers' Food and Suggestions as to Dietary, by Leonard E. Hill, M.B., F.R.S. 12. Statistical Information Concerning Output in Relation to Hours of Work, by H. M. Vernon, M.D. 13. Juvenile Employment. 14. Washing Facilities and Baths. 15. The Effect of Industrial Conditions Upon Eyesight.

——— ——— **Ministry of Munitions.** Mission Appointed by the Director General of Recruiting for Munitions Work. Report on Output of Munitions in France. London, 1916.

——— ——— **War Office.** Women's War Work. London, September, 1916.

Proud, E. Dorothea. Welfare Work, with foreword by the Right Honorable David Lloyd George. London, July, 1916.

Magazines and Newspapers

Labour Woman. (London)
Times (London)
Nation (London)
New Statesman (London)
New York Times
Spectator (London)